

## **Americium-241 Sealed Source User Awareness Training (Read & Sign)**

(All users of Am-241 sources shall read & sign this awareness training sheet, Send completed forms to the NSLS Training Coordinator, P. O. Box 5000, Bldg. 725D, Upton, NY 11973.)

### **Introduction**

Researchers at the NSLS use a sealed source that is commonly known as a “Pocket Synchrotron” to generate X-rays of specific energies in order to calibrate detectors. This source consists of a compact assembly containing a sealed ceramic primary 10 millicurie Americium-241 source in a welded stainless steel capsule with integral tungsten alloy rear shielding. The source excites characteristic X-rays from six different targets in turn:

Target Selected	Energy (KeV)		Dose Rate mRad/hr*	Other Am-241 Information
	K $\alpha$	K $\beta$		
Cu	8.04	8.91	7.8	Half-life: 433 years
Rb	13.37	14.97	11	Principal $\alpha$ -energies: 5.442 (12.5%), 5.484 (85.2%)
Mo	17.44	19.63	16	$\gamma$ -energies: 59.5 keV (35.3%)
Ag	22.10	24.99	15	and others in low abundance
Ba	32.06	36.55	11	X-ray energies: Np L X-rays: 11.9 - 22.2 keV
Tb	44.23	50.65	10	*millirad/hr. dose rate at 1 cm above device

The annular primary source surrounds the X-ray emission aperture in the fixed part of the stainless steel assembly and the targets are mounted on a rotary holder. Each target can be presented to the primary source in turn and the characteristic X-rays from the target are emitted through the 4 mm diameter aperture with a solid angle of ~0.5 steradian. These Am-241 sources are designated as “Accountable” based on activity levels listed in the Code of Federal Regulations (10CFR835) and this training is required by all personnel who use an Am-241 source.

### **Labeling**

Each source’s wooden box is labeled with a unique Sealed Radioactive Source Inventory Bar Code number (e.g. 200106) and with a yellow/magenta Radioactive Material label.

### **Storage and Posting**

When not in use, each source has a permanent storage location in a locked cabinet (the source is also packed inside a wooden box and a metal can). The cabinet has a required yellow/magenta posting titled “Caution: Radioactive Material” with a listing of the source(s) in the cabinet, their activities, and the owner or “Source Custodian” for each source.

### **Obtaining the Source for Use and Returning the Source**

Any person using this source must be fully trained to have unescorted access to the NSLS experimental floor (Facility Specific and GERT training, wearing a radiation badge, BNL ID badge encoded for entry). To obtain the source, contact the Source Custodian. This person will unlock the cabinet to access the Am-241 source. Read and sign this form. Fill in the logbook with your name, telephone extension, type and bar code of the source you are borrowing, the date, and the location at which you will use the source. Obtain the source-specific posting for that accountable source. Take the source to your beamline and mount the source-specific posting on the hutch door to alert personnel to the presence of the source. When done, return the source and posting to the Source Custodian, and enter the return date in the logbook.

### **Important Points**

- **Mount the source-specific posting at the location of use.**
- **Do not place fingers or other parts of the body (such as an eye) near the source’s open aperture.**
- **Do not disassemble or alter the device in any way other than for its intended purpose.**
- **If the source is damaged, do not attempt to repair it; contact the Source Custodian and a Radiological Control Technician.**
- **If the source is misplaced and cannot be found, inform the Source Custodian immediately.**
- **You are not expected to acquire a recordable whole body dose on your radiation badge from handling this source.**

### **Shipment**

The Source Custodian should consult with a Radiological Control Technician if there is a need to store this source in a new location. Transportation of this source to another building on-site or to another location off-site must be arranged by the Source Custodian with a Radiological Control Technician and with Isotope & Special Materials (631-344-5233). Inform the NSLS Departmental Source Custodian in both cases.

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Sign Name

\_\_\_\_\_  
Life/Guest Number

\_\_\_\_\_  
Date

Signature conveys that you have read and understand this information. LS-RAD-AM241 Rev. 05-01-2006 LS-35 ☐

**BROOKHAVEN NATIONAL LABORATORY**  
**NATIONAL SYNCHROTRON LIGHT SOURCE**

**MEMORANDUM**

**DATE:** February 12, 2001

**TO:** Stephen J. Layendecker, RCD Manager  
Henry F. Kahnhauser, RCD HP Technical Services

**FROM:** Nicholas F. Gmür, NSLS ES&H Coordinator

**SUBJECT:** Am-241 Sealed Source User Awareness Training  
(nslsnt1\users\gmur\esh.dir\Am241-train.doc)

This is in response to Steve Layendecker's memo dated January 16, 2001, entitled "Radiation Protection Training Requirements for the NSLS Variable Energy [Am-241] X-Ray Source." We are pleased that you have offered us the option of developing a training course equivalent to Radiological Worker I but which would be more pertinent to the issue at hand, the handling of the Am-241 sealed sources at the NSLS. Such training would satisfy Section 4.2.2 of HP-SOP-14, namely "Be briefed by the Department Source Custodian on source issue and use requirements of their facility."

We propose the use of a one-page Read & Sign document (please see attached). Each user, prior to their next use of the Am-241 source, would read this document, sign and date it, and return the sheet to Eva Rothman, NSLS Training Coordinator. She in turn would enter the information into the BTMS database. Users of Am-241 sources would be required to read and sign this document once, not with each use of the source. At the present time, the attached posting is placed where the source will be used. With your permission, we propose that the source-specific posting include the wording written in bold on the Sign & Read.

We believe that the information in the Read & Sign is concise and highly targeted to instructing the user on the general information, Labeling, Storage and Posting, Obtaining and Returning, Important Points, and Shipment of Am-241 sealed sources. We hope that you agree and will approve the use of this document. Please note that the third data column in the top table is still blank. Henry Kahnhauser will be supplying us with these data. Once we have received your approval, we will formalize this document with the Training and Qualifications Program Office.

cc. W.R. Casey  
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